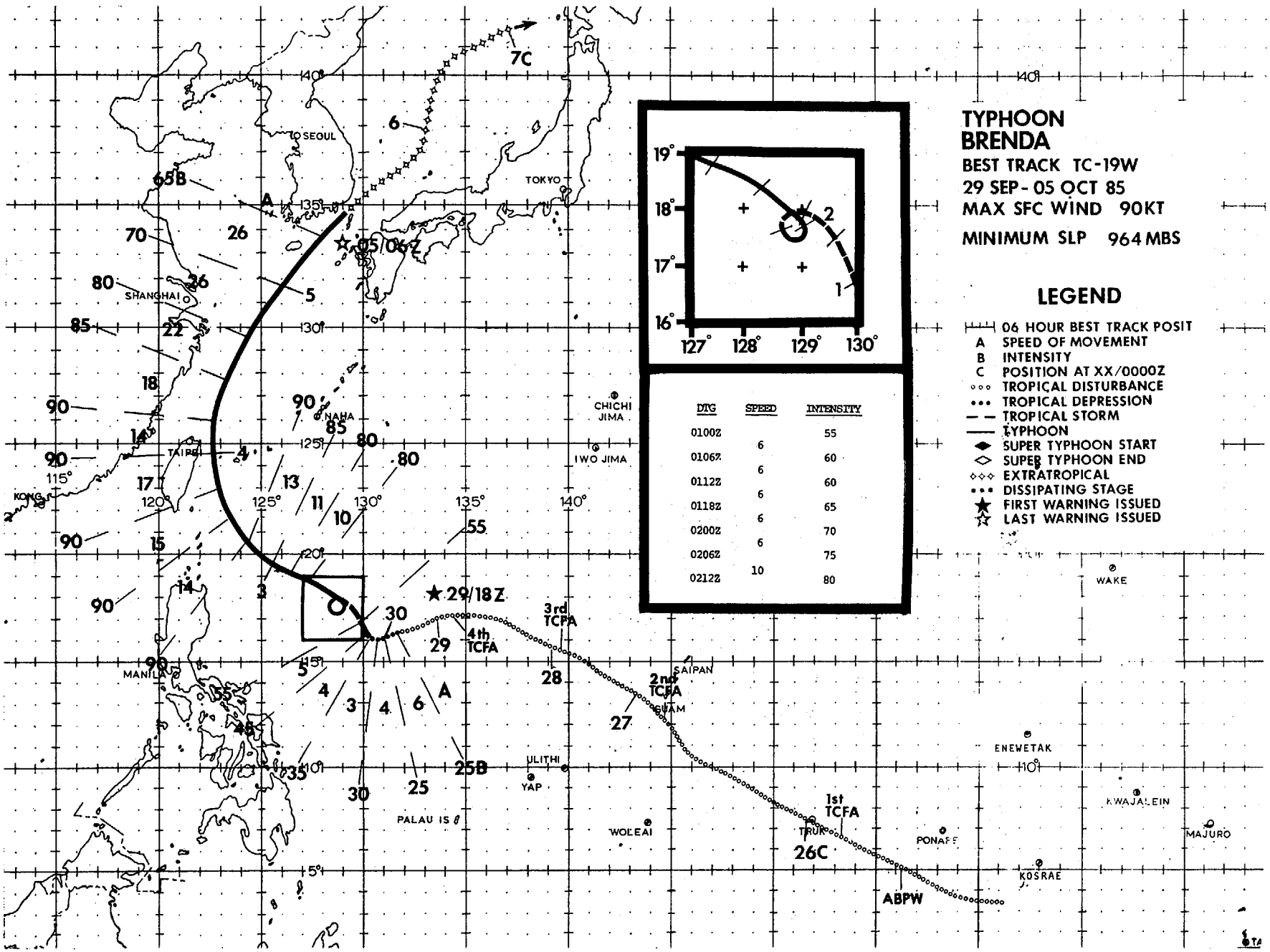
TYPHOON
BRENDA
BEST TRACK TC-19W
29 SEP - 05 OCT 85
MAX SFC WIND 90KT
MINIMUM SLP 964 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
DTG SPEED INTENSITY
0100Z 55
6
0106Z 60
6
0112Z 60
6
0118Z 65
6
0200Z 70
6
0206Z 75
10
0212Z 80
05/06Z
29/18Z
1st TCFA
2nd TCFA
3rd TCFA
4th TCFA
26C
ABPW
SEOUL
TOKYO
SHANGHAI
NAHA
TAIPEI
HONG KONG
MANILA
PALAU IS
YAP
ULITHI
WOLEAI
GUAM
SAIPAN
CHICHI JIMA
IWO JIMA
WAKE
ENEWETAK
KWAJALEIN
MAJURO
PONAPE
KOSRAE
TRUK

Typhoon Brenda developed from a broad, persistent area of convection in the monsoon trough. Its life was influenced by two mid-latitude troughs. The first caused erratic early movement. The second caused Brenda to recurve into the mid-latitude westerlies, a track which was well-forecast by the Joint Typhoon Warning Center.

The disturbance that would become Brenda was first noticed on 25 September as a large area of persistent convection southeast of Truk (WMO 91334). (Further west, the early signs of Typhoon Andy were evident in the western Philippine Sea). Although the system was disorganized, good upper-level outflow was evident. The proximity of the tropical disturbance to Guam and its impressive satellite signature resulted in the issuance of the first of four TCFAs at 252230Z. Aircraft reconnaissance early on the 26th was unable to locate a surface circulation, but did find a broad area of troughing. The area tracked northwest through the 26th, with the convection covering a broad area and upper-level outflow remaining favorable. This prompted the reissuance of the TCFA, at 262230Z, but once again aircraft reconnaissance early on the 27th was unable to locate a circulation. This scenario repeated itself the next day. Finally, late on 28 September, the deep convection began to show an increase in amount and organization. A few hours later, after the fourth TCFA was issued, aircraft reconnaissance found a closed 15 kt (8 m/s) circulation at 290329Z. The slow development of the disturbance was surprising, since it appeared that all the necessary ingredients for development were present. It is thought that the extemely broad size of the disturbance may have prevented a faster development, which is more typical of WESTPAC tropical cyclones (Figure 3-19-1).

The first warning on Brenda was issued at 292347Z, valid at 291800Z, based upon aircraft reconnaissance which located a 20 kt (10 m/s) circulation and a MSLP of 1000 mb - a drop of three

Figure 3-19-1. Visual imagery of the Tropical Disturbance at the time aircraft reconnaissance first located a surface circulation center. This extremely broad area of convection showed little change from the 25th through the 28th. Most of the curvature due to an upper-level anticyclone. The abnormally large size of the disturbance may have slowed development (290107Z September DMSP visual imagery).

millibars in less than 24-hours. Initial forecasts called for the system to gradually increase in intensity, move west-northwest and cross northern Luzon. This was based on the expectation that the subtropical ridge would maintain itself north of Brenda. But, Brenda moved west-southwest followed by a brief turn to the northwest before apparently completing a small cyclonic loop on 1 October. These movements were related to the passage of a mid-latitude trough to the north. Although the trough did not completely weaken the ridge, it eroded the ridge enough to affect the steering flow. As a result, Brenda moved slowly and erratically. By the 2nd, the trough had passed to the northeast and the subtropical ridge began to rebuild. Brenda responded by turning back to the west-northwest while continuing to intensify, eventually reaching typhoon force at 011800Z. At that point it appeared that Brenda would miss northern Luzon and track just south of the island of Taiwan.

On 2 October, aircraft reconnaissance determined that the Typhoon had increased in strength and was more circular. With another mid-latitude trough approaching from mainland China, it appeared that Brenda's track would again be affected in 24- to 36-hours. Using this information and the belief that the subtropical ridge was not going to build far enough west to drive Brenda through the Luzon Straits, the forecast track was revised to recurve Brenda around the end of the ridge just east of Taiwan. Figure 3-19-2 shows the forecast aids

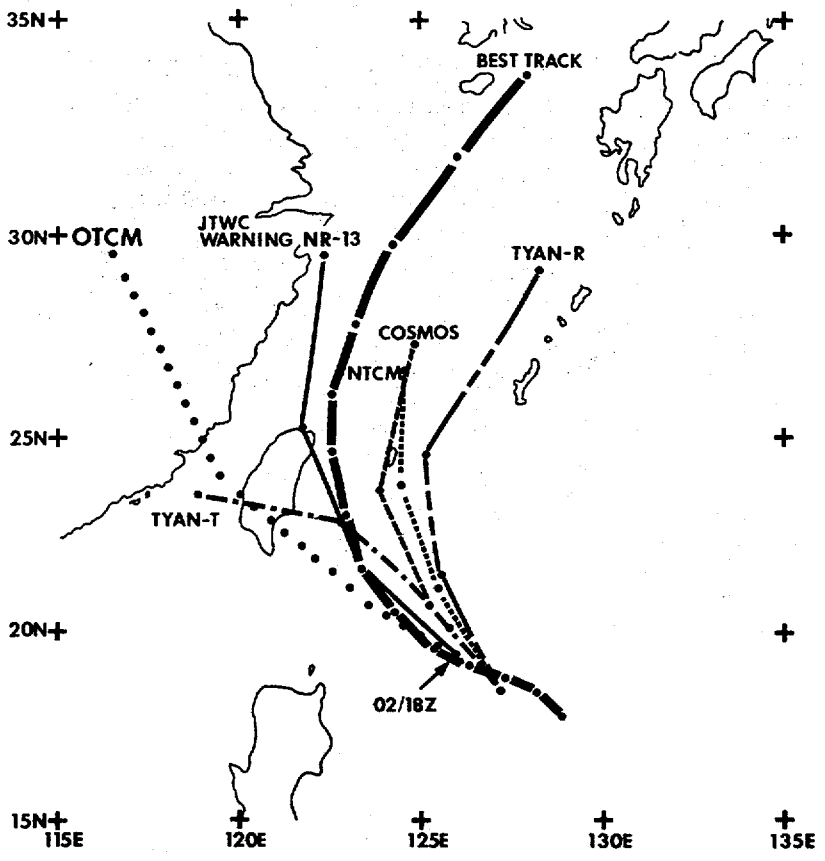

Figure 3-19-2. Forecast aids at 24-hour intervals, when the first recurvature forecast was issued, are compared to the warning and Brenda's best track. While some aids (NTCM, COSMOS and TYAN RECURVER) forecast recurvature; OTCM, JTWC's best aid during the past few years fails to indicate recurvature. All aids are slow in forecasting the speeds of movement during recurvature.

available to the TDO when the first recurvature forecast was issued. This forecast differed considerably from those of other warning agencies, but proved to be quite accurate, although the speed of movement was slow.

Brenda had a unique signature on satellite imagery because of its extremely large eye. Aircraft reconnaissance confirmed the existence of a large banding eye on 3 October. Satellite imagery showed a ragged eye, often larger than 60 nm (111 km) in diameter (Figure 3-19-3). The large eye lasted from 030000Z until Brenda moved around the ridge and began to accelerate into the westerlies on 4 October.

During recurvature, Brenda performed as forecast. It reached a maximum intensity of 90 kt (46 m/s) at 030600Z, and maintained that intensity for 24-hours, as it turned to the north and passed east of Taiwan. Under the influence of the mid-latitude westerlies north of the ridge axis, Brenda turned to the northeast and accelerated, passing just south of Korea on the 5th. Extratropical transition was underway by 050000Z and the final warning was issued at 050600Z. The extratropical remains of Brenda passed through the Korea (Tsushima) Strait and entered the Sea of Japan at 051200Z before slowing down and weakening.

Known damage from Brenda was limited to the southern Korean Peninsula and adjacent islands. Nearly 12 inches (30 cm) of rain was reported over a large area. The Korean National Disaster Relief Center reported 14 dead, 43 missing, and damage to 167 houses, 630 watercraft, and 34,600 acres (14,000 hectares) of rice paddies as a result of the storm's passage. Damage was greatest on the island province of Cheju and the two provinces near the coastal city of Pusan (WMO 47153) in the southeast corner of the peninsula.

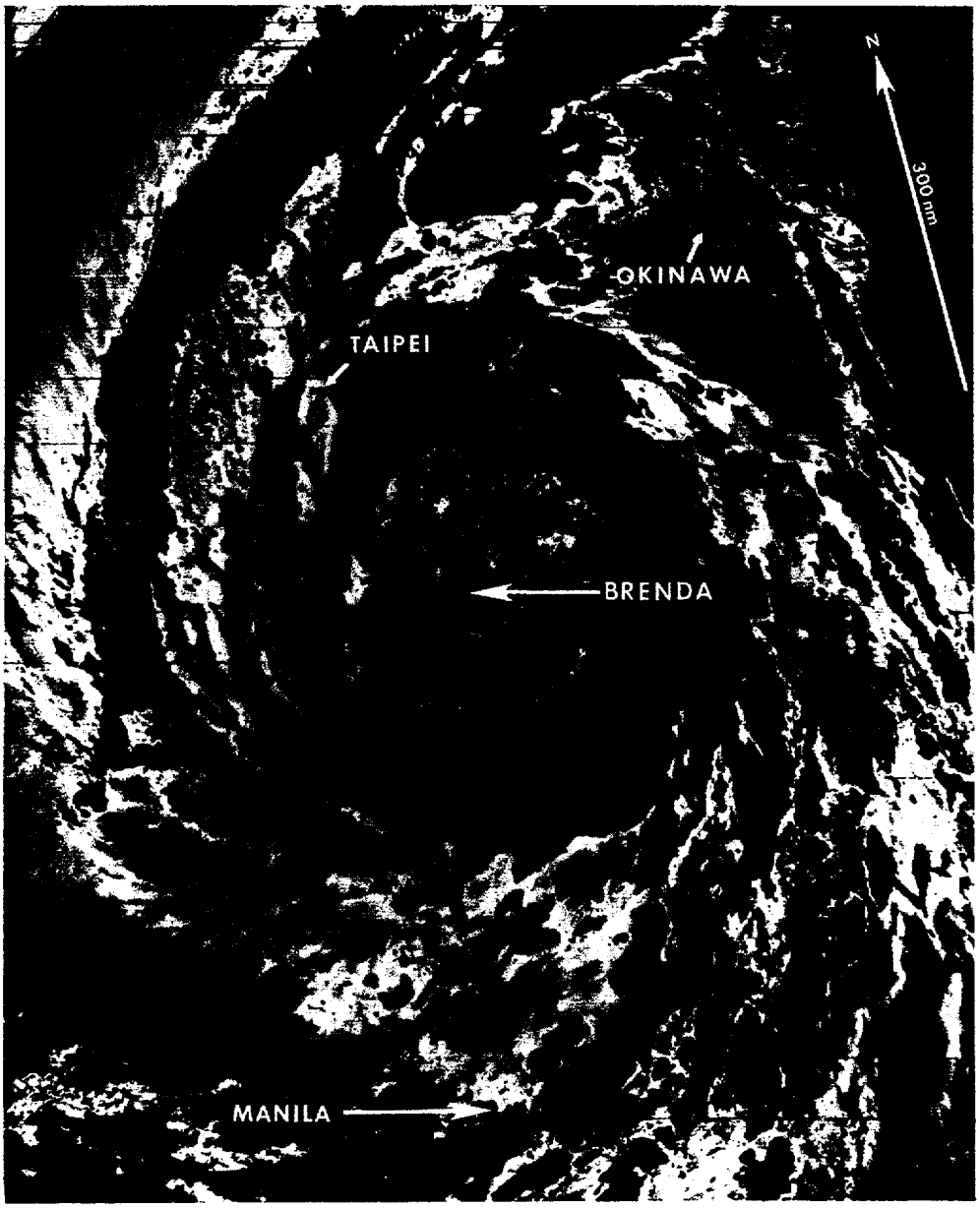

Figure 3-19-3. Nighttime enhanced infrared imagery of Brenda's large eye. The eye is 75 nm (139 km) in diameter (031407Z October DMSP enhanced infrared imagery).